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EXAMINER

KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/881,309

Applicant(s)

SURAMPUDI ET AL.

Examiner

Stephen J. Kalafut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-51 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Claims 8-12, 18, 27-30, 36 and 49-51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "high surface area" in claims 8, 12 and 27 is a relative term which renders the claim indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The use of the trademarks "teflon" (claim 18) and "Nafion" (claims 29, 49 and 51) is considered indefinite since trademarks are used to indicate the origin of a material rather than its chemical nature. The word "type", appended to "Nafion", would also be indefinite, *ex parte* Copenhagen, 109 USPQ 118. Claim 36 depends from itself. Claim 49 depends from nonexistent claim 65. Claim 50 recites a "second component", but no "first component". Claim 51 depends from nonexistent claim 131. *now not*

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

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Claims 4-7 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 6, 7, 9 and 10, respectively, of copending Application No. 09/881,222. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented. Present claim 4 is a duplicate of copending claim 6, written in independent form. Present claim 5 depends on present claim 4, and is a duplicate of copending claim 7, which depends on copending claim 6. Present claim 6 is a duplicate of copending claim 9, while present claim 7 adds the same details as copending claim 10. A copy of the Pre-Grant Publication of the copending application is enclosed, and is numbered 2002/0015872.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

William

Claims 1-3 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 46 of U.S. Patent No. 5,599,638. Although the conflicting claims are not identical, they are not patentably distinct from each other because operating the fuel cell recited by the patented claim, including a fuel mixture containing a "perfluorooctanesulfonic acid additive" (line 5 of claim 46) would require that this particular

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acid is added to the fuel. Regarding claims 2 and 3, determining an optimal concentration would be within the skill of the ordinary artisan.

Claims 37-48 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims and 23-28 of copending Application No. 09/881,222. Although the conflicting claims are not identical, they are not patentably distinct from each other because operating the fuel cell recited in copending claims 23-28 would result in the electrochemical reactions recited by the present claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented. *not*

Claims 8-12 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 of copending Application No. 09/881,222 in view of Fujita *et al.* *keep*

The copending claims recite a fuel cell with a polymer electrolyte and an organic fuel such as methanol, but not the anode catalyst compositions of the present claims. Fujita *et al.* disclose an electrode for use with methanol fuel and an ion exchange membrane electrolyte (column 2, lines 5-23) which includes a metal particles of a mixture of platinum and ruthenium (column 2, lines 37-46), which would to some extent form an alloy. This would be desirable as the fuel electrode (column 2, lines 42-46). The catalyst may also be supported (column 2, lines 47-52), which would imply that carbon is useful. Because Fujita *et al.* teach their electrode compositions as useful with the organic fuel methanol and with a polymer electrolyte, which are

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the components recited by the copending claims, it would be obvious to use the anode of Fujita *et al.* in the fuel cell of the copending claims. This is a provisional obviousness-type double patenting rejection.

Claim 34 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 9 of copending Application No. 09/881,222 in view of Watanabe (US 5,186,877). *not*

Copending claim 9 is identical to present claim 6, from which present claim 34 depends. Claim 34 differs from copending claim 9 by reciting a hydrophilic proton conducting additive added to the anode. Watanabe discloses a fuel cell electrode which includes Nafion ion exchange resin (column 3, lines 50-61), which would have the presently recited properties, and teach its use in a direct methanol fuel cell (column 1, lines 6-9). Since methanol is a type of organic fuel as recited by copending claim 9, it would be obvious to use in the fuel cell electrodes recited thereby, the Nafion ion exchange resin of Watanabe. This is a provisional obviousness-type double patenting rejection.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claims 31, 32, 35 and 50 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawana *et al.* (US 4,390,603). *Not*

Kawana *et al.* disclose a methanol fuel cell including a first chamber (5), an electrode (1) therein with a surface exposed to the chamber, including an electrocatalyst and the hydrophobic additive PTFE (column 2, lines 47-50); an electrolyte (3) through which hydrogen ions (protons) pass (column 2, lines 52-55); and a cathode (2), which receives the hydrogen ions and allows then to react with oxygen (column 2, lines 57-60). The fuel is methanol, which would be a non-acidic component which is oxidized at the anode, which includes platinum particles. (It should be noted that claims 32 and 35 do not require acid to be totally absent. Claim 32 only requires that something other than an acid is oxidized at the anode. Likewise, claim 35 requires only that the anode can catalyze non-acid fuels.) The anode chamber is connected to a supply line (6) and an exhaust port (7), which together would constitute a circulating system. In operation, the cell of Kawana *et al.* would receive aqueous methanol at its anode, oxidize the methanol to produce hydrogen ions (protons), pass these ions through the electrolyte, and use them to reduce oxygen (the present "second component", to the extent that the term is understood).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 13, 14, 17, 19-21, 23, 25, 26, 33 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawana *et al.* (US 4,390,603) in view of Watanabe (US 5,186,877).

These claims differ from Kawana *et al.* by reciting that the anode includes a wetting agent, or that the anode has both ionic and electronic conductivity, such as by including an ionomeric additive or a hydrophilic proton conducting additive. Watanabe disclose electrodes for a methanol fuel cell (column 1, lines 6-9), which include Nafion ion exchange resin, which is conductive to protons, ionomeric, and to some extent hydrophilic and thus a wetting agent (column 3, lines 50-61). Because Watanabe teach his electrodes are being useful in the type of fuel cell disclosed by Kawana *et al.*, because these electrodes “can be in perfect contact” with the ion exchange membrane (column 2, lines 24-26), and because these electrodes can contribute to the realization of a compact and powerful fuel cell (column 2, lines 34-36), it would be obvious to use the electrodes of Watanabe in the fuel cell of Kawana *et al.* For the purpose of this rejection, claim 36 is interpreted as if it depended from claim 35, a possible typographical error.

Claims 15, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawana *et al.* in view of Watanabe as applied to claims 14 and 17 above, and further in view of Fujita *et al.* (US 4,478,917).

The above combination does not teach the present anode catalyst compositions. Fujita *et al.* disclose an electrode for use with methanol fuel and an ion exchange membrane electrolyte (column 2, lines 5-23) which includes a metal particles of a mixture of platinum and ruthenium (column 2, lines 37-46), which would to some extent form an alloy. This would be desirable as the fuel electrode (column 2, lines 42-46). Fujita *et al.* also teach that their cathode should

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contain a hydrophobic material (column 2, lines 24-32). Because Fujita *et al.* teach their electrode compositions as useful with the organic fuel methanol, oxygen as a cathode reactant, and a polymer electrolyte, it would be obvious to use the anode of Fujita *et al.* in the fuel cell of Kawana *et al.*, previously modified according to Watanabe.

Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawana *et al.* in view of Watanabe as applied to claim 21 above, and further in view of Sakairi *et al.* (US 5,453,332).

The above combination does not teach carbon paper as a backing material for the anode. Sakairi *et al.* teaches carbon paper as a backing material for an electrode which includes Nafion along with a catalyst (column 3, lines 39-50). Because the carbon paper would provide mechanical stability as well as current conduction, it would be obvious to use the carbon paper of Sakairi *et al.* as a backing for the electrodes of Kawana *et al.*, modified according to Watanabe.

Claims 27-30 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. The process of making a fuel cell electrode including repeated steps of impregnating an electrode structure with a catalyst, immersing the impregnated structure into an ionomer solution, and then drying the structure, is not disclosed in the prior art.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koseki (US 5,234,776) discloses a solid electrolyte fuel cell system with a water

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distributor. Sterzel (US 4,828,941) discloses a methanol fuel cell with an anion exchange membrane, which is permeable to CO₂.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is (703) 308-0433. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

sjk
May 23, 2003



STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP

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